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मानक

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Jawaharlal Nehru

“Step Out From the Old to the New”

IS 10791 (1983): Control cable assembly for mopeds [TED 6: Automotive Body, Chassis, Accessories and Garage Equipments]



“ज्ञान से एक नये भारत का निर्माण”

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“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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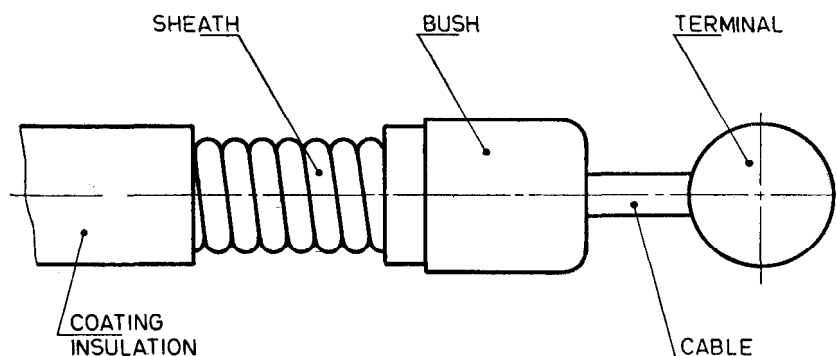
Indian Standard

(Reaffirmed 2001)

SPECIFICATION FOR CONTROL CABLE ASSEMBLY FOR MOPEDS

1. Scope — This standard covers the dimensions and other requirements of control cable assembly comprising of flexible cables, end terminals and outer casing (sheaths and bushes) for mopeds. Cable adjusters are separately covered.

2. Construction Details — A typical control cable assembly shall be as shown in the Figure.



2.1 Cable — The recommended dimensions of cable are given in the following Table.

Nom Dia of The Cable, mm*	Dia of Elementary Wire, mm	No. of Elementary Wires†	Construction of the Cable	Min Breaking Load for Inner Cable, KN
1.20	0.30	12	9/3	1.2
1.60	0.35	12	9/3	2.2
1.80	0.35	19	12/6/1	2.8
2.0	0.40	19	12/6/1	3.4
2.50	0.50	19	12/6/1	5.4
3.0	0.60	19	12/6/1	7.0

*Tolerance on the dia of the cable $\pm \frac{7}{1}$ percent.

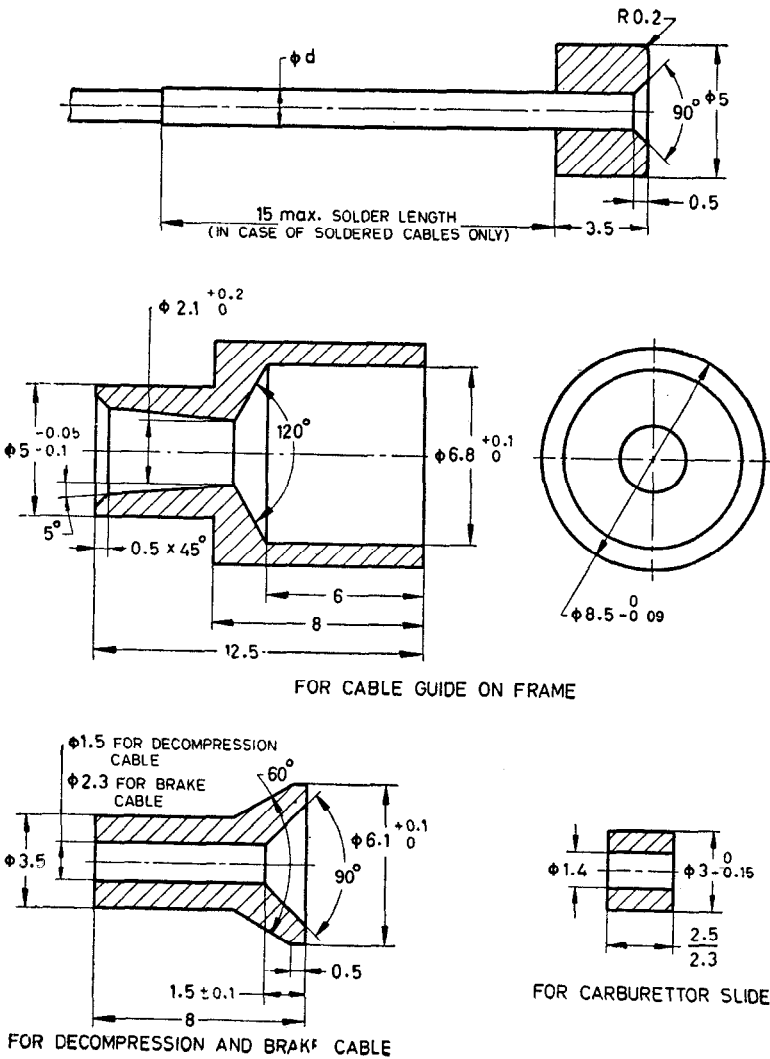
†The number of elementary wires shown should be considered as minimum and does not restrict the use of a cable with a larger number of wires; a larger number of wires improves the quality of resistance and flexibility.

2.2 Terminals — Shall be of three types :

- | | |
|--------------------------|--------|
| a) Cylindrical | Type 1 |
| b) Through barrel | Type 2 |
| c) Split barrel with pad | Type 3 |

The shapes and dimensions for use in mopeds shall be as given below:

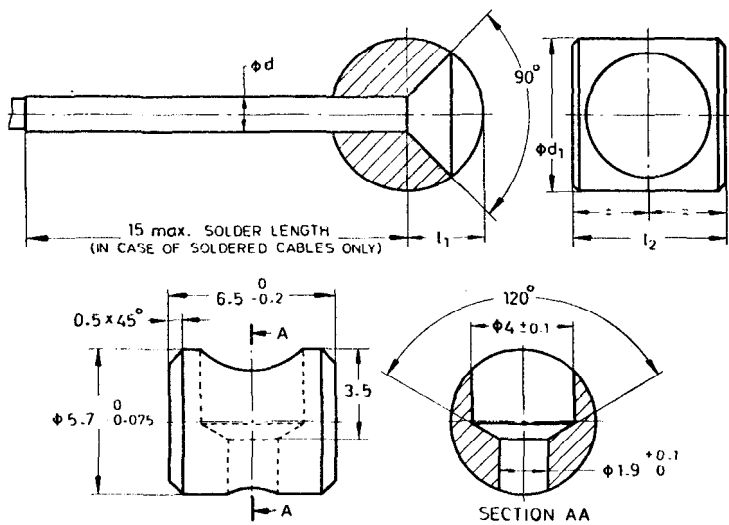
Type 1 — Cylindrical



All dimensions in millimetres.

Nom Cable Diameter	1'20	1'60
Dia 'd' for Terminal	1'40	1'80

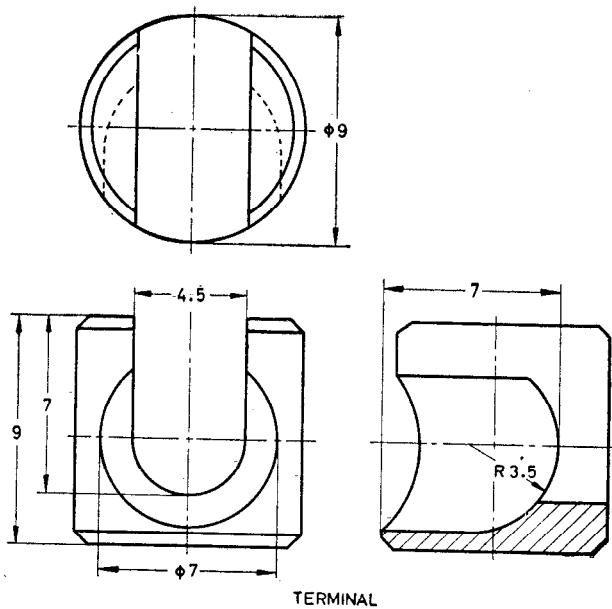
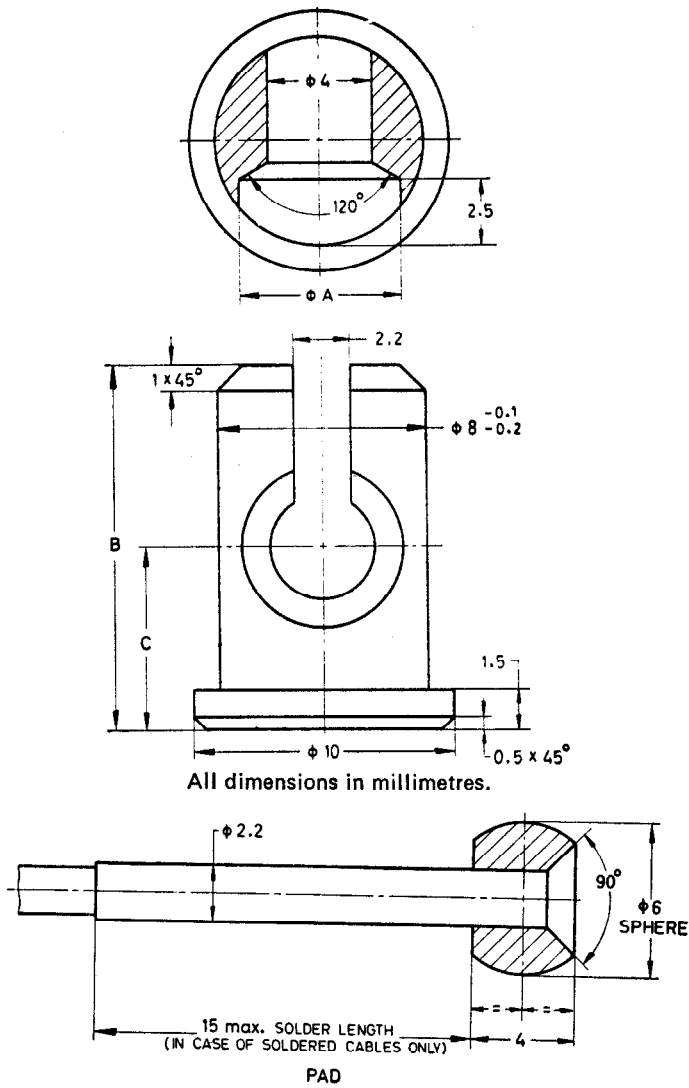
Type 2 — Through Barrel



All dimensions in millimetres.

Nom Cable Diameter	Dimensions for Terminals			
	d	d_1	l_1	l_2
1.0	1.20	6	3.0	6
1.2	1.40	6	3.0	6
1.6	1.80	9	4.50	9
1.8	2.20	9	4.50	9
2.5	2.80	9	4.50	9
3.0	3.30	9	4.50	9

Type 3 — Split Barrel With Pad



	$A \pm 0.1$	B	C
For Decompression Cable	6.2	14	7
For Rear Brake Cable	6	16	7.5

Type 3 terminals are generally used for cables of 1·8 mm diameter and above. A flange of 9·5 to 11 mm diameter and 1·5 mm thick may also be provided with this type of terminals.

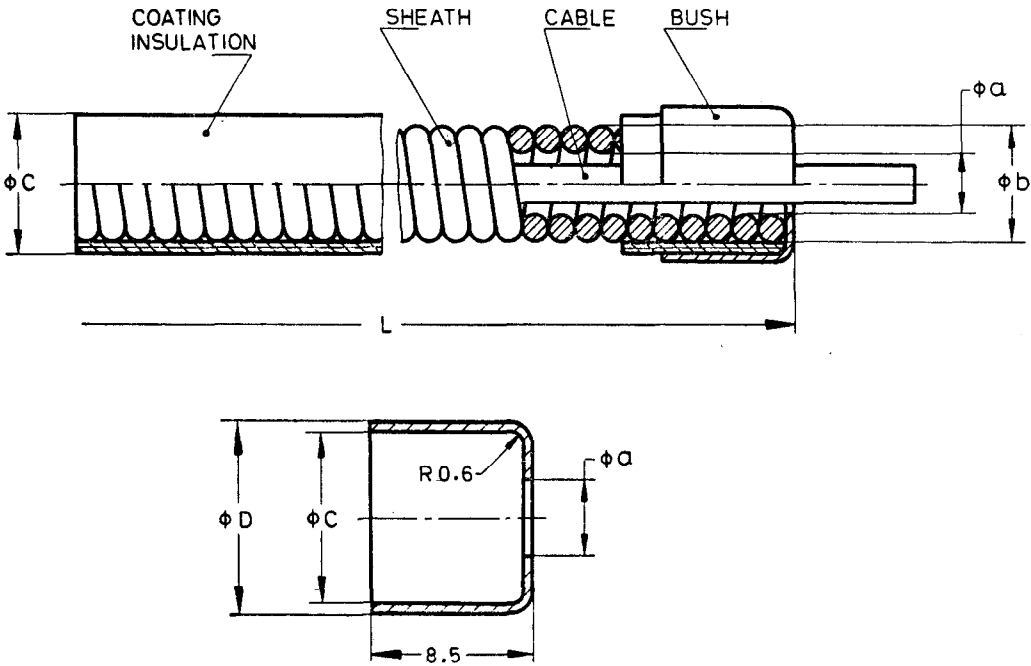
2.2.1 Selection of terminals — The selection of terminals with their corresponding cable diameter depends upon the uses for control of various devices. A recommendation for the selection of terminals with cable is as follows:

Type	Nominal Diameter of Cable, mm	Recommended Use
1 and 2	1·2 1·6	Accelerator, decompression valve, choke
2	1·6 1·8 2·0 2·5	Gear selector, front brake, clutch
2	2·5 3·0	Rear brake
3	1·6 1·8 2·0 2·5 3·0	Accelerator, brake, clutch

For interchangeability the measurement of dimensions shall not be greater than the values shown for different types of terminals.

The outer dimensions are the measurement after soldering.

2.3 Outer Casing — Recommended dimensions for sheaths and bushes corresponding to the cable sizes are given below:



All dimensions in millimetres.

Nom Cable Diameter <i>d</i>	Sheath			Bush <i>D</i> ± 0·1
	Inner Diameter <i>a</i> ± 0·3	Outer Diameter <i>b</i> ± 0·3	Diameter Over Coating <i>C</i>	
1·2	2·00	3·70	5	5·6
1·6 1·8 2·0	2·70	4·70	6	6·6
2·60 3·0	4·0	7·50	9	10·0

For interchangeability, the diameter over bush 'D' and outer diameter of sheath 'b' shall not be greater than the values shown in 2.3.

2.3.1 Selection of sheaths — The selection of sheaths with their corresponding cables depends upon their uses for various controls that is, acceleration, choke, gear selector, front brake, clutch and rear brake. The recommendation for the selection of sheath with cable are as follows:

Nominal Cable Diameter mm	Sheath Diameter mm	Recommended Uses
1.2	5.0	Accelerator, choke, Decompression valve
1.6	6.0	Gear selector with hand grip control
1.8 2.0	6.0	Gear selector, clutch, front brake, rear brake
2.5 3.0	9.0	Rear brake, brake with pedal, parking brake with lever

3. Material

3.1 Cable

3.1.1 The ropes and strands shall conform to the following Indian Standards:

IS : 5836-1977 Inner wire ropes for automobile control cables (*first revision*)

IS : 6594-1977 Technical supply conditions for steel wire ropes and strands (*first revision*)

IS : 1835-1976 Round steel wire for ropes (*third revision*)

3.1.2 General requirements

- The cables are of the spiroidal and insert types
- The elementary wire shall have a resistance to breaking when subjected to a stress of 16 N/mm² (160 kg/mm²).
- The insert cable is made up of more elementary wires which shall not unwind when it is cut.
- The complete cable or strand shall be securely and evenly laid and be free from defects, kinks, loose wires, open strand and other irregularities and shall remain in this condition when unwound from the coil.
- After cutting the cable to the finished length the free end (end without terminal) shall be coated with soldering material up to a minimum of 8 mm length to fill up sharp cut edges and provide positive protection to avoid unwinding. The finished diameter over coating shall not exceed more than 1 percent of its maximum diameter.
- The bush shall be fixed in position by crimping.

3.2 Terminals

3.2.1 The material shall conform to IS : 226-1975 'Structural steel (standard quality) (*fifth revision*)'. If of brass, it shall conform to IS : 4170-1967 'Brass rods for general engineering purposes' or IS : 4413-1967 'Brass wires for general engineering purposes'.

3.3 Outer Casing

3.3.1 Spring wire for sheath — It shall be patented and cold-drawn spring steel wire of Grade 1 of IS : 4454 (Part 1)-1975 'Steel wires for cold formed spring: Part 1 Patented and cold drawn steel wires — unalloyed (*first revision*)'.

3.3.2 Outer casing insulation — Stable fibre yarn with weatherproof lacquering or PVC as per agreement between the purchaser and the manufacturer shall be used.

3.3.3 Bush — Steel conforming to IS : 226-1975.

4. Tests

4.1 Cable — A sample of the cable or strand shall be subjected to a tensile test to destruction as described in 4.1.1 to 4.1.7.

4.1.1 Before the elongation test, the cable shall undergo an initial setting by means of a load of at least 10 percent of the minimum breaking load.

4.1.2 The test sample shall be of sufficient length to provide a clear test length of at least 36 times the diameter of the rope.

4.1.3 Not more than 20 to 25 percent of the minimum breaking load may be applied quickly, but thereafter the load shall be applied slowly and steadily until the actual load is obtained.

4.1.4 Tests in which breakage occurs adjacent to the grips may, at the option of the manufacturer, be discarded.

4.1.5 The tensile testing machine used shall be such that its accuracy can easily be checked and adjustment made, if necessary.

4.1.6 The elastic elongation at 33 percent of breaking load shall be between 2 to 6 percent and the minimum elastic elongation at the breaking load shall be 25 percent.

4.1.7 The zinc coating on galvanized wires shall meet the requirements for type 'B' coating of IS : 4826-1976 'Hot dip galvanized coatings on round steel wires (first revision).'

4.2 Terminals

4.2.1 Pull out load — The minimum load of separation of the terminals from the cable shall be in accordance with the table given below:

Type of Terminal	Nominal Cable Diameter, mm	Pull Out Load kg
1	1.0	40
	1.2	60
	1.6	80
2	1.0	60
	1.2	80
	1.6	150
	1.8	200
	2.5	220
	3.0	250
3	1.8	200

4.2.2 Load time — The following shall be the period of load application while testing as per 4.2.1.

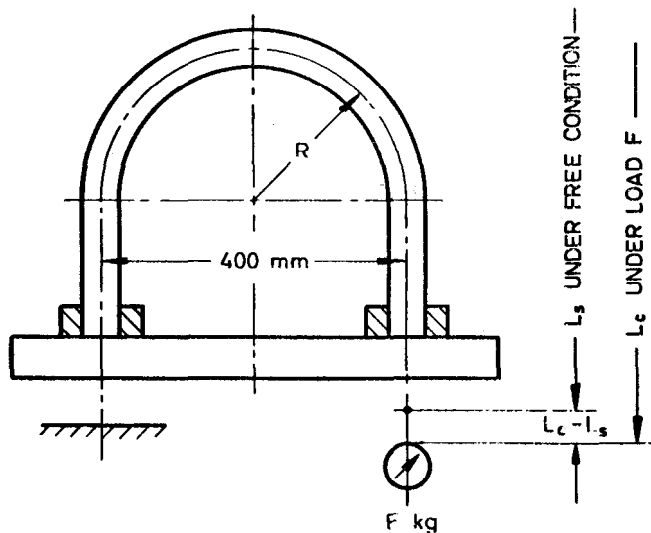
Brake cable, Clutch cable 80 kg for 5 minutes

Throttle 40 kg for 1 minute

4.3 Outer Casing

4.3.1 The sheath shall not show any crack or deformation when bent through a radius of curvature twice its diameter.

4.3.2 Coefficient of shortening 'α' — For determination of coefficient of shortening the sheath is submitted to a load test as shown in the figure below for a period of 1 minute.



Sheath diameter, mm	5	6	9
Load in kg	100	200	400

For the determination of 'α' the following care is taken:

- the length of the sheath shall be at least 0.5 m;
- the sheath recovers after loading; and
- the shortening shall be not greater than $L_s \times 0.008$ where L_s is the length of sheath before load application. In any case, under the above loads, α shall not be more than 0.8 percent.

4.3.3 Pullout load for casing cap or bush — The minimum load of separation of the casing bush/cap shall correspond to the following:

Sheath diameter, mm	5	6	9
Pull out load, kg.	5	6	15

5. Designation

5.1 Cable — This shall include the nomenclature, nominal diameter of the cable in mm, length and number of this Indian Standard.

Example :

A cable of nominal diameter 1.2 mm and length 2.5 mm shall be designated as:
Flexible cable 1.2 × 2.5 IS : 10791

5.2 Terminals — Shall be designated by nominal diameter of cable for which terminals will be used, the type of terminal and number of this Indian Standard.

Example :

The terminal for a flexible cable having nominal cable diameter of 1.8 mm with terminal Type 2 will be designated as:

Terminal for nominal cable diameter, 1.8, Type 2 IS : 10791

The designation in addition to indication of the type may also indicate the material and surface treatment.

5.3 Outer Casing — Shall be designated by the nominal cable diameter in mm, length in metre and number of this standard.

Example :

An outer casing for 1.2 mm nominal cable diameter and length of 2.5 metre shall be designated as outer casing for flexible cable with terminals, 1.2 × 2.5 IS : 10791.

5.4 Complete Control Cable Assembly — Shall include the nomenclature, nominal cable diameter in mm, and length in metre, the type of terminals, length in metre of outer casing, number of this standard.

Example :

The designation of a flexible cable drive having nominal cable diameter of 1.8 mm and of length 2.5 metre using terminals split barrel type with pad at one end (type 3) and cylindrical type (type 1) at another end and a length of outer casing of 2.25 metre shall be.

Flexible cable with terminals 1.8 × 2.5 × 1.3 × 2.25 IS : 10791.

The length of the cable includes the portion which goes inside the terminal for soldering as specified by the purchaser.

6. Marking

6.1 The complete cable assembly shall be marked with indelible ink or transfer label with the following:

- a) Cable designation,
- b) Manufacturer's trade name or mark, and
- c) ' Made in India '.

6.2 ISI Certification Marking — Details available with the Indian Standards Institution.

7. Sampling

7.1 Unless otherwise agreed to between the buyer and the seller, the sampling inspection shall be carried out according to the procedure given in IS : 2500 (Part 1)-1973 'Sampling inspection tables, Part 1 Inspection by attributes and by count of defects'. The sampling plan to be followed for the different characteristics shall be as given in 7.1.1 and 7.1.2.

7.1.1 For visual and dimensional characteristics, the single sampling plan with inspection level IV and Acceptance Quality Level (AQL) of 2.5 percent given in Table 1 and 2 of IS : 2500 (Part 1)-1973 shall be followed.

7.1.2 For the various tests given under 4 the sampling plan with inspection level II and AQL 1 percent given in Table 1 and 2 of IS : 2500 (Part 1)-1973 shall be followed.

8. Packing — Shall be as agreed to between the purchaser and the supplier and shall be as per best prevalent trade practice.

EXPLANATORY NOTE

In preparing this standard considerable assistance has been derived from JASO 7214 'Control cables for two wheelers' prepared by Society of Automotive Engineers, Japan.